



Hoffman wins DOE Early Career Research Award

July 1, 2020

Matthew Hoffman, of the Fluid Dynamics and Solid Mechanics group, received a highly valued Early Career Research Program funding award from the US Department of Energy's Office of Science. This is the 11th year DOE has provided the awards, designed to bolster the nation's scientific workforce with support to exceptional researchers during their early careers.

"We are committed to supporting our early-career scientists at the Laboratory. Their contributions are essential to continuing our proud tradition of excellence," said Director Thom Mason. "Matthew's award reflects the important science our young researchers are doing for both the Laboratory, its mission, and the nation."

Hoffman's winning proposal, "*Creating a Sea-Level-Enabled E3SM: A Critical Capability for Predicting Coastal Impacts*," creates a regional sea level modeling capability within the Energy Exascale Earth System Model (E3SM). Hoffman's proposal is the fourth LANL early career project to be awarded since 2009 through the Office of Biological and Environmental Research's Earth and Environmental Sciences Division at the Office of Science.

"We're proud of Matt and his accomplishments. His research is an important piece of the E3SM because it fills a critical gap for predicting regional sea-level rise and its impact on the environment, communities and infrastructure along the U.S. coastline," said Marianne Francois, Theoretical (T) Division Leader. "Matt's research will account for the interactions between the ocean, ice sheets, and solid Earth and lead to a new model for regional sea-level rise in E3SM."

Hoffman is a member of the LANL climate modeling team. The modeling team is responsible for the ocean and ice model components of E3SM, DOE's flagship Earth system model, and studies Earth's complex water cycle, cryosphere and biogeochemical systems. E3SM is a multi-laboratory project supported by the Office of Biological and Environmental Research in the DOE's Office of Science.

Current Earth system models are not able to predict regional sea-level change that can greatly vary from region to region, with some areas seeing higher surge than others. Hoffman's unique modeling tool will be used to quantify the role of regional sea level in future storm surge off the U.S. coast. These first fully consistent regional sea level projections from an Earth system model will be used to investigate the accuracy of existing methods that rely on adding disparate, non-interacting contributions to sea level. The sea-level-enabled E3SM provides a critical missing link required for making

actionable projections of coastal impacts with E3SM. The project provides the DOE with a tool for predicting regional sea level targeted to agency needs.

About Hoffman

After receiving undergraduate and master's degrees in civil and environmental engineering, Hoffman earned his doctorate in environmental sciences and resources with an emphasis in geology from Portland State University. There he studied melting of glaciers in the McMurdo Dry Valleys of Antarctica. He then worked as a research associate at NASA Goddard Space Flight Center, conducting field research on meltwater-induced acceleration of the Greenland Ice Sheet. He joined the Laboratory as a postdoctoral researcher in 2011 and became a technical staff member in the Fluid Dynamics and Solid Mechanics Group in 2014.

Hoffman investigates interactions between ice sheets, the ocean, and the broader climate system and resulting impacts on sea level and is a lead contributor to ice sheet and Earth system models developed at the Laboratory and DOE. He received a 2015 Laboratory Directed Research and Development (LDRD) Early Career Researcher Award for his work on connections between subglacial hydrology and glacier flow. Hoffman has regularly taught at summer schools for glaciology and Earth system modeling and has served on the Earth Systems Review Board for the Laboratory's Center for Space and Earth Science and as a team lead for the Cryospheric Climate Change sub-area working group contributing to the National Earth Observing Assessment 2016.

About the DOE Early Career Research Program Award

For the 2020 award program, DOE selected 76 scientists from across the nation, including 26 from DOE's national laboratories and 50 from U.S. universities. Under the program, researchers based at DOE national laboratories will receive grants of \$500,000 per year. The research grants are planned for five years and will cover salary and research expenses.

To be eligible for the DOE award, a researcher must be an untenured, tenure-track assistant, or associate professor at a U.S. academic institution or a full-time employee at a DOE national laboratory, who received a Ph.D. within the past 10 years. Research topics are required to fall within one of the DOE Office of Science's six major program offices.

Los Alamos National Laboratory

www.lanl.gov

(505) 667-7000

Los Alamos, NM

Managed by Triad National Security, LLC for the U.S Department of Energy's NNSA

